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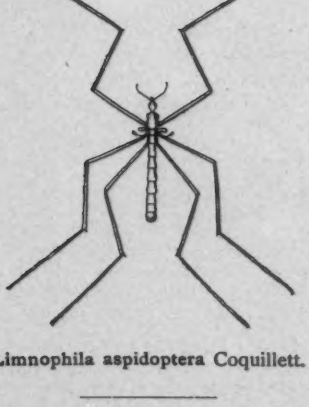

Limnophila aspidoptera Coquillett.

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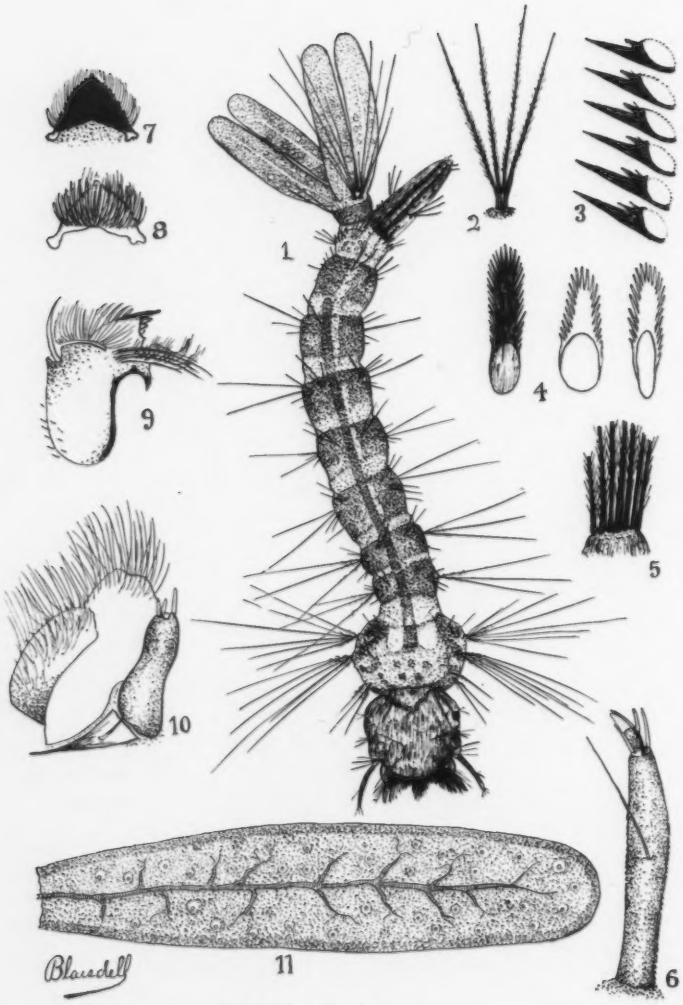

CULEX VARIPALPUS COQ.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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CONTENTS:

Blaisdell—Notes and descriptions of the larva of Culex varipalpus Coq. 107
Coquillett—A new Culex near curriei. 109
Skinner—On Dr. Dyar's Review of the Hesperidæ 110
Riley—A Malpighian tube within the heart 113
Houghton—Notes on Cænocara oculata Say 114
McClendon—Notes on the true Neuroptera 116
Howard—An interesting new genus and species of Encyrtidæ 121
Aldrich—The Dipterous genus Calotarsa, with one new species 123
Britton—Some new or little known Aleyrodidæ from Connecticut—II 127
Slingerland—Formaldehyde as an insecticide 130
Williamson—Dragonflies (Odonata) collected by Dr. D. A. Atkinson in Newfoundland, with notes on some species of Somatochlora 133
Johnson—An emergency case in insect architecture 139
Editorial 140
Doings of Societies 141

Notes and Description of the Larva of Culex varipalpus Coq.

BY F. E. BLAISDELL.

(Plate III)

At the 14th meeting of the Pacific Coast Entomological Society (ENT. NEWS, Vol. XVI, No. 3, p. 96, I reported the finding of an interesting *Culex* larva in Contra Costa Co., Calif. Imagines subsequently bred from the larva were submitted to Prof. Coquillett, who pronounced the species *Culex varipalpus*.

The larvae are remarkable for their elongate form, large anal branchiæ and sluggish, awkward movements. All of the larvae of this species that I have seen were taken from a hole in a sycamore tree; for the last three years they have been abundant, from July to January, when there was sufficient rain to keep water in the hole.

The largest larvæ (Fig. 1 of Plate) are 7 to 8 mm. in length, including the siphon, and nearly six times longer than the width of the prothorax. Color is yellowish to a dirty

white, anal siphon more or less black, head ferrugineous with sutures ventrally and spots laterally piceous.

The head is subquadrate, narrower than the prothorax, slightly wider than the abdominal segments, comparatively small in the younger larvae, widest at or just back of the eyes, tempora scarcely at all subangulate, the frontal surface quite evenly and moderately convex. The antennae (Fig. 6) are more or less piceous, usually whitish beneath, slightly more than one-half as long as the head, very feebly arcuate, cylindrical, slightly and gradually narrowing at apex, and terminating in a small colorless, pointed segment; laterally at middle is a long seta.

The mandible (Fig. 9) and palpus (Fig. 10) are sufficiently characterized by the figures. The mentum (Figs. 7 and 8) is triangular with the sides slightly arcuate, and finely subdenticulo-crenulate, the internal surface (Fig. 8) is clothed with very fine hairs or cilia.

The thorax is transversely oval; at each side there are four or five well-developed tufts of long setae, of which the dorsal two are only given in the figure.

The abdominal segments, 3 to 7, are subequal, segments 1 and 2 are apparently shorter.

The pecten of the eighth segment consists of a patch on each side of the segment, of about 15 to 19 chitinous scales, apparently arranged in two transverse rows; one or two scales may constitute another or third row; the anterior row has 9 or 10 scales, while the posterior some 5 or 6, their line of attachment being just caudad to that of the anterior row, and usually alternating with them; sometimes they are arranged in anterior-posterior series, which is never perfect; each scale is elongate, flattened, with the margins fringed with spines (Fig. 4), the scales vary in form as indicated by the figures.

The anal siphon is about three times as long as wide, apparently shorter in the younger larvæ. The siphonal pecten consists of a single straight series of 13 scales, situated at basal fifth and reaching the base. Each scale (Fig. 3) is very acute, with one to three smaller spines at proximal side of the base.

The anal branchiae are little more than four times longer than wide, and about equal to the 5th, 6th and 7th abdominal segments taken together; each branchia has a median longitudinal trachea with short lateral rami that may divide once or twice; small rounded areas are to be observed scattered sparsely within the branchia, within each circle is a small central circle. The branchia are easily detached.

The setae of the larvae are peculiar, inasmuch as they are clothed with fine hairs. Figure 5 represents the basal part of a thoracic tuft, while figure 2 illustrates a tuft from the eighth segment.

The larvae are fragile, especially in preservative fluids.

In the pupae the respiratory siphons are small and comparatively inconspicuous, while the two anal branchiæ are nearly oval, slightly longer than wide, slightly and rather broadly emarginate at apex, with a small, slender seta projecting backwards from the centre of the emargination; margins at sides are minute spinulo-denticulate, at apex minutely spinulose.

As a whole the pupa is slender, the abdomen elongate, and distinctly dorso-ventrally depressed.

A new Culex near curriei.

By D. W. Coquillett.

Culex lativittatus, n. sp.

So very similar to *curriei* that I am unable to detect any difference, except in the stripe of brown scales in the middle of the mesonotum. In the present species this stripe is very broad, covering more than one-fifth of the width of the mesonotum, the borders almost parallel and well marked. In *curriei* this stripe is much narrower, covering less than one-ninth of the width of the mesonotum, its borders not well defined, usually with a narrow line of brown scales on either side of it, but separated by a stripe of yellowish white scales.

Santa Clara and Alameda Counties, California. A large series of both sexes received from Miss Isabel McCracken.

This is evidently the species referred to by Mr. Quayle in the January number of the News, under the name of *curriei*. The latter appears to be a fresh-water species. Mr. Frederick Knab informs me that the larvae of the two forms are very distinct.

On Dr. Dyar's Review of the Hesperidae.

By Henry Skinner.

Dr. Dyar has published in the Journal of the New York Entomological Society* A Review of the Hesperidæ of the United States. The value of the paper is greatly impaired by the lack of sub-family definitions, and it is impossible for anyone not familiar with the sub-families to use the keys to the genera the author gives. Nearly the whole classification of the Hesperidæ is based on the presence or absence of the costal fold, a male secondary sexual character. The females therefore must work out their own salvation. This costal fold appears to be distributed through the family in a most arbitrary way and in closely related species one will have it and the other not. Unfortunately it has not been used in a logical manner for generic separation. The two species, *bathyllus* Abbott & Smith, and *pylades* Scudder, are remarkably close specifically, yet *bathyllus* is the type of *Thorybes* Scudder and *pylades* the type of *Cocceius* Godman & Salvin. *Cocceius* is based on the presence of a costal fold in the male. The logic and the beauty of this is seen from the fact that in the genus *Eudamus*, *simplicius* Stoll has a costal fold while *dorantes* Stoll lacks it. Why are they not different genera? This fact invalidates Dr. Dyar's first key and makes such a classification absurd. The genus *Cogia* Butler is based on another secondary sexual character, the presence of a pencil of hairs near the abdominal fold of the secondaries. The species appear to be more nearly related to species in the other genera as segregated. *Phædinus caicus* Herrich-Schaeffer, *moschus* Edws., is so close specifically to *bathyllus* that they are frequently confounded yet they are placed in different genera. The same may be said of *bathyllus* and *pylades*. The writer does not admit that a single secondary sexual character proves their non-relationship. In passing it is noted that in the Biologia, *caicus* H. S. and *moschus* Edwards, while not specifically separated, are said to differ by the latter being lighter in color, palpi whiter and hyaline spots larger, yet they separate *Pyrrhopyga arizonæ* and *P. araxes*

* Vol. XIII, p. 111.

on the same or lesser characters and are followed by Dr. Dyar. Inconsistencies of this character are frequent in the family. Dr. Dyar says there is a costal fold in *Murgaria* (*Eudamus*) *coyote* Skinner and places it as a synonym of *albociliata* Mabille. Godman and Salvin place one species, *albociliata*, in *Murgaria* and say it does not have a costal fold. If we logically follow out the significance of this we have a single species in two genera. This is by no means unusual in "up-to-date genera" as we see the same thing in Bull. 52 U. S. N. M. But as my knowledge of genera is only "an opinionated attempt to discredit them" I can't be expected to follow such fine points of modern scientific classification.

On page 114 there are seven genera with eleven species. This comes pretty close to one apiece. *Montivaga* Reak. is placed in the genus *Pyrgus* Hubner and *syrichtus* Fab. in the genus *Heliopetes* Billberg. Dr. Dyar says *syrichtus* falls in *Heliopetes* on the presence of a hair pencil on the hind tibiæ. This is most extraordinary, as *syrichtus* and *montivaga* are one species. *Hylephila phylæus* and *Polites coras* Cram. (*peckius* Kirby) certainly look lonely. It may be mentioned here that thirty-five years ago Mr. Scudder erected many genera of the Hesperidæ without descriptions. They were only indicated by specific types. There were about thirty in all. These have been stumbling blocks and our Hesperid genera will be in a chaotic condition until they are thoroughly studied. Dr. Dyar has recognized practically all of them, and this has been the cause of much confusion, as shown by his Revision. To one knowing the species it can be said, without fear of contradiction, that in the Pamphilinæ the species in given genera are more nearly related to species in other genera than they are to each other. This would not be so bad if the genera would hold irrespective of natural relationship. *Catia* has a single species, *otho*, and *Thymelicus* twenty, and these twenty will show greater variation in slight differences among themselves than they do from the lonely segregated one. Those under *Erynnis* show a sad mixture and would make five or six genera of equal value to those used. For example compare *leonardus* and *morrisonii*; *juba* and *metea*. In *Ochlodes* compare

snowi and *verus*, *nemorum* and *sassacus*. *Atrytonopsis hianna* and *Lerodea loammi* are so close specifically that they may be topomorphs, yet they are placed in widely separated genera. *A. python* Edws. should not be placed where it is. Compare *fusca* and *textor* in the genus *Stomyles*. The association of *scudderi* and *aaroni* may go in an "up-to-date classification," but nature would never recognize it.

Maculata and *eufala* would never agree to being associated in *Lerodes* if they knew it. The same theory applies to *arpa*, *palatka*, *byssus*, *dion* in relation to *yehl* and *pontiac*. The species under *Prenes* are closely related. *Padraona dara* Kollar is the same species as *omaha* Edw. *Omaha* is the type of *Potanthus* Scudder (1872). *Padraona* Moore (1881). Dr. Dyar says *Megathymus cofaqui* Strecker and *M. streckeri* Skinner are not well separated. The specimens and the literature prove otherwise. *M. aryxna* Dyar is a synonym of *neumoegeni* Edw. The fig. 3, pl. 69, Biol. Cent. Amer. Het. is not *neumoegeni*, as stated by Dr. Dyar.

Dr. Dyar assumes that I am not familiar with the genera of the Hesperidæ, because I have not used all or many of those proposed. I have not used them because in many cases they are unscientific, illogical and untenable. Dr. Dyar's Revision proves the correctness of my position. I can't logically be held responsible for not proposing better ones. When I became interested in the family the species were in great confusion in collections, and I never saw a collection where they were all correctly named. I have named specimens for many years from all over the country and the species is the unit of classification, and a multiplicity of bad genera—a Tower of Babel.

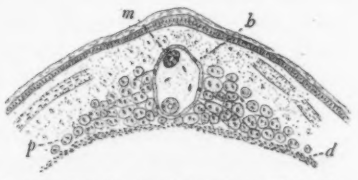
I WISH to report that out of 335 *T. polyphemus* cocoons about 40 had stems. One contained a parasite.—RICHARD KUSCHEL, Chicago, Illinois.

MR. E. P. VAN DUZEE, of the Grosvenor Library, Buffalo, New York, has gone to Jamaica for a few weeks' collecting trip. We may look forward to an increase in our knowledge of the Hemipterous fauna of that island.

A Malpighian Tube Within the Heart.

By William A. Riley, Cornell University.

We are accustomed to variety in the location of the urinary organs of the Arthropoda, but one is a little surprised to find a Malpighian tube within the heart. And yet such a condition sometimes occurs among the insects. So far as has been found it occurs only in certain Orthoptera. The accompanying illustration from a cross-section of the abdomen of an Acridid, the common *Melanoplus femoratus*, shows two cross-sections of a Malpighian tube within the cavity of the heart. On tracing these it is seen that they do not represent two tubes, but rather a single one which is doubled upon itself.



Cross-section of pericardial region of *Melanoplus femoratus*—*d*, dorsal diaphragm; *p*, pericardial cells; *m*, malpighian tube; *b*, heart.

Aside from a brief incidental mention by Kowalevsky, 1894,* this condition seems to have escaped notice. In studying the heart of *Pachytilus* this worker was surprised to find in the middle region of the abdomen, Malpighian tubes within the cavity of the heart. Supposing, at first that it was a pathological condition, he studied the same region of the heart of *Locusta viridissima* and found exactly the same condition. In this species, it was easy to recognize that the Malpighian tube reached the heart by way of the cardio-coelomic aperture, and that after a tortuous course it passed through the cardio-pericardial aperture into the pericardial chamber. Later, he found the same condition in the nymph of an undetermined Locustid.

As a result of his studies, Kowalevsky reached the conclusion that this condition was not pathological but perfectly normal for the Acrididae and Locustidae. He sought to explain the strange phenomenon as a case of physiological attraction. In most animals,—Molluscs, Vertebrates, Crustaceans,

* Kowalevsky, A. 1894. Etudes sur le cœur de quelques Orthopteres. Communication preliminaire. Arch. Zool. exp. 3 ser. t. 2 pp., 485-490.

—the acid and alkali-eliminating organs (distinguished respectively by their ability to take up carmine, or indigo-carmine) are united into one. Thus we have the urinary tubules and the Malpighian corpuscles in the kidney of the Vertebrates; the urinary canals and the peripheral saccules in the decapod Crustaceans; the pericardial glands and the organs of Bojanus in the Lamellibranchs. In the insects, however, we have these organs, represented respectively by the pericardial cells and the Malpighian tubes, entirely separate. Kowalevsky concludes that "there thus results a certain physiological attraction between the organs, which leads to the penetration of the Malpighian tubes into the region occupied by the acid-eliminating part of the kidney, that is to say, into the region of the pericardial cells."

I have studied a number of series of adults of *Melanoplus femoratus* and of both adults and nymphs of *Melanoplus femur-rubrum* but have observed the phenomenon in only the one individual. In addition, I have examined series of *Chortophaga* (nymph and adult), *Œcanthus*, *Gryllus*, and *Blatta*, but have met with no further instance. The Orthoptera possess from thirty to a hundred and fifty Malpighian tubes and yet of all these Kowalevsky found but a single one within the heart of any individual. If we have in the phenomenon a perfectly normal case of physiological attraction, why does it affect but a single tube, or how account for the fact that it has never been observed in any other order of insects? The condition is an interesting one, but the evidence certainly goes to show that it is a purely accidental one. Whether it is merely mechanical, brought about by the movements of the insect, or whether it is an abnormal method of growth, is a question.

Notes on Caenocara Oculata Say.

By C. O. Houghton, Newark, Del.

In his "Revision of the Ptinidae of Boreal America," recently published, Mr. H. C. Fall writes, in part, of the genus *Cænocara* as follows: "The species of this genus, or at least some of them, are known to pass the larval state in puff balls (*Lyco-*

perdon). The perfect insects are found for the most part on oak foliage." On Sept. 26 last, Mr. H. S. Jackson, Asst. Mycologist of the Delaware Station, brought me a specimen of a species of *Scleroderma* which he had taken in an open grove made up rather largely of oak trees. A slight cut which had been made in the *Scleroderma* revealed the presence within of numerous small, white coleopterous larvae in their cells. I placed the specimen, which measured about one and one-half inches in diameter, in a glass dish, which was covered with a small pane of glass, and set it aside in my laboratory to await developments. One larval cell, which was opened enough to reveal the presence of a larva within, was examined occasionally, and on October 5th an adult, nearly of normal color, was found within it. This cell, when examined two or three days previous, had contained a pupa, but the exact length of the pupa stage was not determined. On October 12th, I found a number of specimens in the dish, and by partially breaking open the *Scleroderma* several more were secured, making about 25 specimens in all. On October 18th, 44 more specimens were secured, and a few days later a few others, enough to bring the total to 72, were found. An examination of the body of the *Scleroderma* showed that it had been pretty thoroughly worked over by the larvae.

When a number of the adults were inclosed together in a small vial, a very evident stridulation was noticed at times which reminded one somewhat of that made by *Conotrachelus nenuphar* under similar conditions, though weaker, of course.

It may be of interest to note, further, that a few specimens of *C. oculata* have been taken in trap-lanterns at this place.

THE INFALLIBLE ERRS.—The March, 1906, number of The Journal of the New York Entomological Society, edited by Dr. Harrison G. Dyar, page 7, lines 23, 24, gives us *cupracens*, instead of *cuprascens*, as a specific name in *Cicindela*, and on page 51, line 23, Lacápède for Lacépède. Very little experience in proof-reading is required to teach the proof-reader how easy it is to overlook typographical errors, and were it not for certain remarks quoted in the NEWS for *December, 1905*, page *316*, we would not dream of calling attention to these slips in our esteemed contemporary. It is a certain satisfaction, however, to meet with evidence that its Editor is of not altogether different clay from the rest of the entomological fraternity.—ONE OF THE PHILADELPHIANS.

Notes on the True Neuroptera.

J. F. McCLENDON.

2.—*On Venation in Neuroptera.*

The wings of Neuroptera have been variously treated by systematists, and a few species have been considered by Comstock and Needham in their excellent series of articles in the 32d and 33d volumes of the American Naturalist. In 1901 I commenced to collect material for a developmental and comparative study of the venation of the group, but on account of pressure of other duties, failed to get many pupae, and had to content myself with studying the tracheation of the fully formed wings by bleaching them for days in chlorine water.

In distinguishing the veins, I have used the nomenclature of Redtenbacher as applied by Comstock and Needham.

SIALINA.

The wings of *Sialina* are broad and seemingly irregularly reticulated, but if we leave out of consideration the cross veins, the venation can easily be reduced to the hypothetical type of Comstock and Needham. The anal space of the hind wings is thin and folded when at rest.

SIALIDÆ.

In *Corydalis texana*, Fig. 1, the sub-costa and radius run

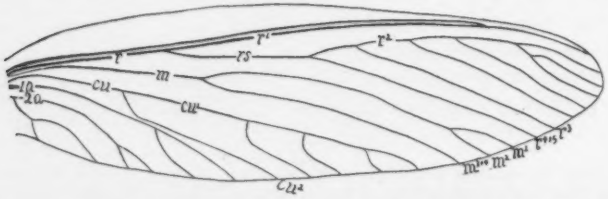


Fig. 1.—*Corydalis texana.* Fore wing. In this as well as in the succeeding figures the cross veins are omitted, save where they are represented by spaced lines.

parallel nearly to the tip of the wing, where they fuse. The radial sector has become pectinate by fusion of r^4 and r^5, as shown by Comstock and Needham. R^2 has three side branches,

one of which is divided into two. M^3 and m^4 are fused. Cu^1 has three side branches. The first, second, and third anal veins each branch once.

In *Sialis infumata*, Fig. 2, the anterior wing is modified by the fusion of cu^1 and m for some distance, and associated with this, the radius assumes a bowed form. M^1 and m^2 are fused. In the hind wing the bases of the median and cubitus are fused. M^1 and m^2 are fused. M^3 and m^4 are fused.

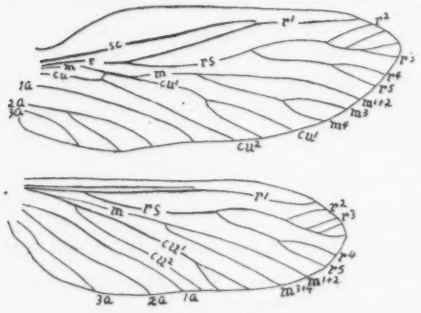


Fig. 2.—*Sialis infumata.*

RAPHIDIDÆ.

In *Raphidia oblita*, Figs. 3 and 4, the sub-costa reaches the margin of the wing before the pterostigma. In the anterior wing the radius, media, and cu^1 are fused for a short distance. In the posterior wing the bases of the radius and media are fused for some distance and *cu* fuses with the first anal through the middle third of its course.

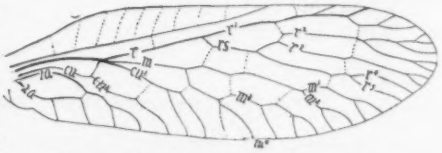


Fig. 3.—*Raphidia oblita.* Fore wing.

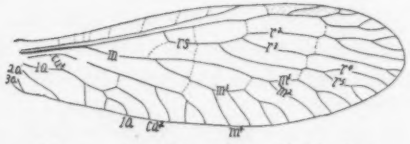


Fig. 4.—*Raphidia oblita.* Hind wing.

HEMEROBINA (MEGALOPTERA).

MYRMELEONIDÆ.

In the *Myrmeleonidæ* we have typical venation save that many accessory veins have been added distally and the branch-

ing of the median has been almost or quite completely suppressed.

In *Ululodes hyalina*, Fig. 5, the sub-costa and radius run parallel to the pterostigma, where they unite. The radial sector is branched dichotomously, though it is functionally

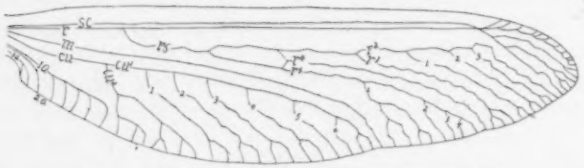


Fig. 5.—*Ululodes* (Ulula) *hyalina*. Fore wing.

pectinate, R^4 being united to R^{2+3} by a strong cross vein. The media is unbranched. R^1, r^5, Cu^1 and the anal furnish numerous veinlets by pectinate branching.

In *Myrmeleon rusticus*, Fig. 6, the number of accessory

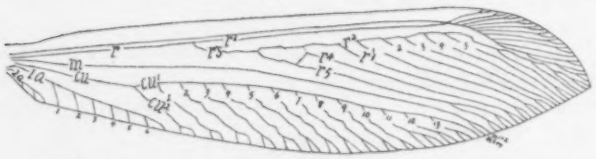


Fig. 6.—*Myrmeleon rusticus*. Fore wing.

veins is very much increased, Cu^1 having thirteen branches, each of which subdivides once.

HEMEROBIDÆ.

In the *Hemerobidæ* the radial sector has become pectinate by splitting of R^{4+5} as shown by Comstock and Needham for *Hemerobius*.

In the fore wing of *Micromus posticus*, Fig. 7, the radial sector is suppressed and the radius has become pectinate. Whether this has been caused by fission or coalescence, I have not enough material

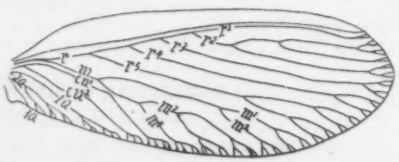


Fig. 7.—*Micromus posticus*. Fore wing.

to decide, but when we compare it with the hind wing, where the radial sector is distinct, we see the magnitude of the change. The cross-vein connecting r^1 with r^4 in the hind wing, Fig. 8, suggests that the change has been brought about by shifting of the trachea from longitudinal to cross veins—many tracheæ are found misplaced in the pupa, and this change might easily occur—the change would then be coalescence and not fission, as can be easily understood by studying the accompanying figures of the fore and hind wings. The sub-costa and r^1 run nearly parallel to the end of the wing.

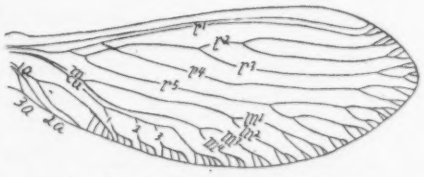


Fig. 8.—*Micromus posticus*. Hind wing.

In *Polystoechotes punctatus*, Fig. 9, R^2, by pectinate brach-

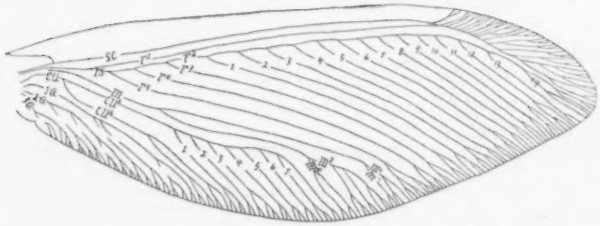


Fig. 9.—*Polystoechotes punctatus*. Fore wing.

ing, gives rise to fourteen veinlets, each of which subdivides twice. Cu^1 has seven such branches. The sub-costa and r^1 fuse at the pterostigma and give rise to fifteen such veinlets.

MANTISPIDÆ.

In *Mantispa interrupta*, Figs. 10 and 11, the sub-costa runs through the middle of the pterostigma for the last third of its course, and disappears near its end. The base of

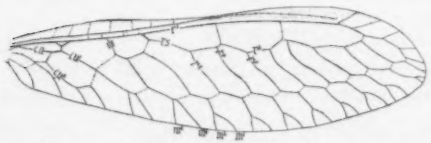


Fig. 10.—*Mantispa interrupta*. Fore wing.

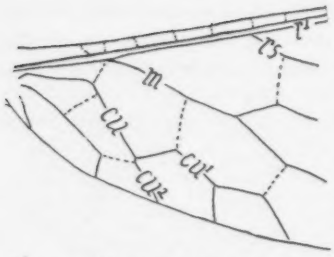


Fig. 11.—*Mantispa interrupta.* Part of hind wing.

the media fuses with that of the radius for some distance; and, in the anterior wing, Fig. 10, the media dips down and then fuses with the radius again thus forming a small triangular cell. After the media is finally free it divides into the typical number of branches.

CHRYSOPIDÆ.

In the *Chrysopidæ* we find a great modification by coalescence.

In the anterior wing of *Chrysopa plorabunda*, Fig. 12, the veins in the middle run zigzag and fuse at their angles, forming a reticular structure without the interposition of true cross veins. The so-called "cross vein" of the "third cubital cell" (m^3+^4) behaves in a very peculiar manner: m^3+^4 runs obliquely forward and coalesces for some distance with m^1+^2, and then separates from it again.

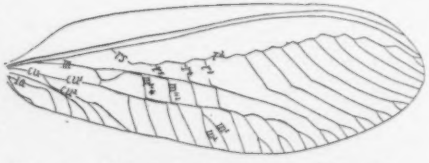


Fig. 12.—*Chrysopa plorabunda.* Fore wing. Where veins have coalesced I have represented them slightly separate for clearness of interpretation.

The hind wing, Fig. 13, resembles Myrmeleon, save that *rs* and *m* coalesce for some distance.

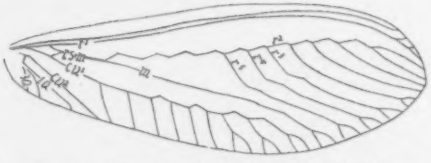


Fig 13.—*Chrysopa plorabunda.* Hind wing.

PANORPINA (MECAPTERA.)

PANORPIDÆ.

The venation of the *Panorpidæ* is quite typical, save for the fusion of veins near the base of the wing, due to narrowing of this region, and the development of a few accessory veins.

In *Panorpa confusa*, Fig. 14, r_3 branches once.

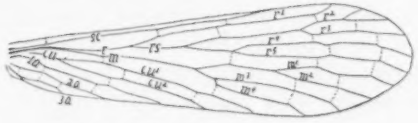


Fig. 14.—*Panorpa confusa.* Wing.

In *Bittacus strigosus*, Fig. 15, *m* and Cu^1 coalesce for some distance.

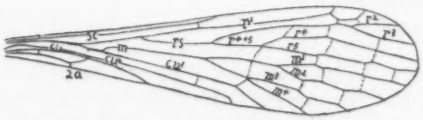


Fig. 15.—*Bittacus strigosus.* Wing.

An Interesting New Genus and Species of Encyrtidae.

By L. O. Howard.

The newspapers have given an account of how the State Board of Horticulture of California sent an orange or lemon tree to China in charge of Mr. George Compere, in order to stock it with Chinese parasites of the red scale and then return it to California. Mr. Compere has been good enough to send me specimens of the parasites reared in China, one of which proves to be a small variety of *Aphelinus diasphidis* mihi, and the other is the remarkable form described below.

COMPERIELLA gen. nov.

Female: Body robust, abdomen slightly shorter than thorax; head not oblong; antennae flattened, broad; tip of scape, pedicel, funicle joints and club of equal width, pedicel tringu-

lar, funicle joints 6 in number, much shorter than broad, compressed, cup-shaped; club suboval, three-jointed, as long as all 6 funicle joints together, slightly flattened at the tip, first joint longest, third joint shortest Wings with an oblique hairless line running from stigmal vein anally and distally; three hairless spaces beyond the middle of the wing, and two broad diverging bands of cilia beginning about the middle of the wing, the uppermost ending at wing apex and the other half way from this point to the rounded anal angle. Marginal vein very short; stigmal short, obtuse, descending at nearly right angles to the wing margin. Ovipositor scarcely extruded.

Male: Unknown. Comes nearest to *Habrolepis*. Name derived from Compere (George).

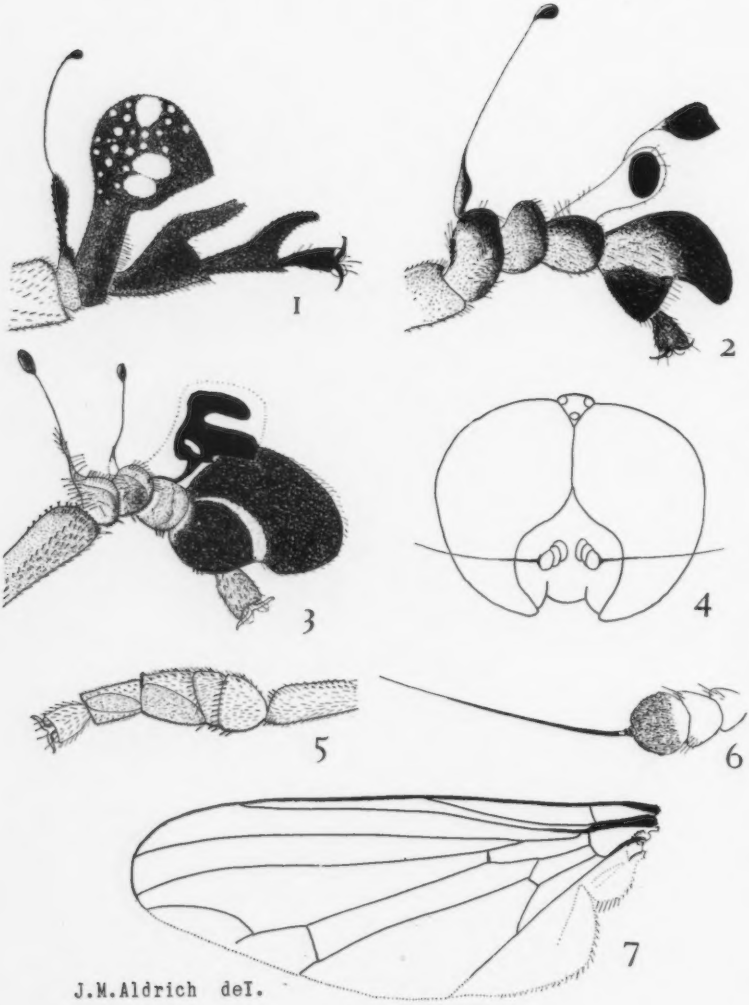
Comperiella bifasciata sp. n.

Length: 1.1 mm.; expanse, 2.1 mm.; greatest width of forewing, .33 mm. General color black, with greenish-golden reflections on mesoscutum, and bluish metallic reflections on mesoscutellum. Head with a central longitudinal occipital band which extends on pronotum, with a yellowish longitudinal band either side. Antennae uniformly dark brown, nearly black, somewhat lighter at tip of club. Front femora and tibiae dusky, becoming light toward the tip of the tibiae; first 4 tarsal joints very light yellow, apical joint dusky. Hind femora and tibiae dark brown, nearly black; tarsal joints white, except apical joint, which is black. Wings hyaline, except for a dusky patch below stigma, and 2 divergent fascia of a brownish color corresponding almost exactly with the bands of cilia mentioned in the generic description; a small darker brown spot at marginal vein.

Described from one female specimen bred from *Aspidiotus* (*Aonidiella*) *aurantii* Maskell, by Mr. George Compere.

Habitat: China. Type to be deposited in the U. S. National Museum.

THE OHIO UNIVERSITY LAKE LABORATORY, at Cedar Point, will be open from June 25th to August 3d. The course in entomology will include collecting, mounting, and identifying insects in connection with studies in life history and anatomy. Excellent opportunities for life history studies are offered both on aquatic and terrestrial forms. Prof. Osborn, State University, Columbus, Ohio, will be in charge.



THE DIPTEROUS GENUS CALOTARSA.

The Dipterous Genus Calotarsa, with one new Species.

By J. M. Aldrich.

(Plate IV)

The discovery of a new species of this charming little group makes it worth while to give a brief review of the genus.

Townsend, in 1894 (Canadian Entomologist, XXVI, 50-52, figs.), described the genus and its typical species, *Calotarsa ornatipes*, from a single male specimen collected at Champaign, Ill. He referred the genus to the family Syrphidae, in which he acknowledged that it would occupy a very anomalous position. The error of overlooking the family Platypezidae was corrected by Banks in the next number of the journal (p. 88); he expressed the opinion that *Calotarsa* was a synonym of *Platypeza*, and reported another male specimen in his collection, taken at Ithaca, N. Y. In the following number of the journal, Townsend admitted the relationship of the genus to the Platypezidae, but contended that it was not synonymous with *Platypeza* (p. 102). Williston in the same number (p. 116) mentioned the genus as probably synonymous with *Platypeza*.

Late in 1894, W. A. Snow published in the Kansas University Quarterly (III, 143-152, 1 pl.), a revision of the North American Platypezidae, with several new species; a supplement to the paper was added in the same publication in January, 1895 (III, 205-207). He did not accept *Calotarsa*, referring *ornatipes* to *Platypeza;* he described another species with greatly ornamented hind feet, under the name of *Platypeza calceata*. Of this he had seventy-five males and one female, collected in Hop Canyon, Magdalena Mts., N. M., on August 19-21, 1894. He also reported another specimen of *ornatipes*, sent him by me, and collected by me on a window at Brookings, S. D. No other species with ornamented hind tarsi have been known up to the present, nor have any other specimens of the two described species come to light, as far as I know.

In my catalogue of North American Diptera, I recognized *Calotarsa* as a distinct genus, mentioning that I did so on Mr. Kahl's recommendation.

The question whether it is really synonymous with *Platypeza* I am unable to settle at present, not having access to material in typical *Platypeza*. Snow declared that a somewhat larger size and the ornamentation of the hind tarsi of the male were the only characters to separate the two genera, and he thought them insufficient. The typical Platypezas figured by Snow show in the male the hind tarsus but little modified—less than in the female—nothing at all of the surprising structures shown in his figures of *ornatipes* and *calceata*, which I reproduce on my plate. The question of synonymy I leave in abeyance, rather hoping that further examination of abundant material may show characters applicable to both sexes; at least we have subgeneric characters in the feet of the male.

The two species previously known and the one herein described will be readily separated by the* characters of the hind tarsi of the males, as shown in the plate. I will only add in this connection that otherwise the three species are exceedingly close together, *insignis* being more uniformly yellow on the abdomen than the other two. The female of *ornatipes* is as yet unknown, while of the other two *insignis* has a wholly pure yellow abdomen, differing slightly from *calceata*. The three species form a very compact group, whether of generic or subgeneric rank.

In regard to the habits of the adults and the function of the tarsal ornaments, little has been observed. In *ornatipes*, only three specimens are known, one of which was collected on a window—obviously an accidental occurrence. Of *insignis*, the type male was collected hovering in the air in half-shady open woods, about four feet above the ground; the females were all collected in rather open woods, hovering in the air, most of them over a wet spot in a shady road, which no doubt attracted them, as the weather at the time was intensely dry. It was about four in the afternoon, and no males were flying at the time. Snow noted a few interesting points about the habits of *calceata*. The flies were "dodging and soaring in the air

* Secondary sexual characters are very constant in Diptera, whatever may be the case in other animals. I remember hearing Dr. John B. Smith say that he found the same constancy in Lepidoptera. I have long believed that Darwin over-estimated the variability of these characters in general.

in assemblages of, say, a dozen individuals. None were caught outside an area of about an acre." "In flight these insects allow their hind feet to hang heavily downward, and look as if they were carrying a burden." His single female was one of a pair that were copulating on the wing.

These enlarged feet naturally suggest those of *Dolichopus*, a genus of flies somewhat distant from this, in which the males parade their tarsal ornaments assiduously before the females. When the front tarsi are ornamented, the insect stands on the ground to display them, but a case is known in which the middle tarsi are the beautiful ones, and the male of this species hovers over the sitting female so that the tarsi hang before her. In *Calotarsa* it is not unlikely that both sexes are on the wing while these exhibitions occur, hence it may be very difficult to make close observations of them.

Before passing to the general description of the new species, I will describe the hind tarsi of the male, as they are extremely interesting and remarkable.

All the first four joints are compressed, and on the inner surface have a fine brush of close appressed yellow bifurcated hairs, which is best developed on the second and third segments. These joints are all provided with a vertical groove at the distal end, enclosing the proximal part of the succeeding joint; hence the second and third appendages appear in side view as if they arose between two segments. The outer side of the first and second joints has numerous stiff hairs, which end in very slight knobs.

The first joint has on the upper side near the base a slender, long process, ending in an oval disk; its basal part is somewhat thickened, and has a few of the blunt hairs before mentioned.

The second joint has a similar organ arising in a corresponding position; in this case the process is smaller, and at the base is compressed and transparent.

The third joint has attached to its upper surface, from the base nearly to the apex, a very thin membrane-like expansion, which is of a bright silvery color, and bears a peculiar jet-black pattern. It has somewhat the appearance of a flag, and

suggested the specific name (*insignis*, distinguished by a mark).

The fourth has a large, comparatively thick expasion upward and outward, which is black in color, and is set off from the body of the joint by a white or somewhat silvery crescent.

The fifth joint is not at all compressed, and has in fact a perfectly normal structure, rather depressed.

The figure shows the "flag" lapped over a little on the enlarged fourth joint.

Calotarsa insignis n. sp.

Male.—Length, 6.5 mm. Head and thorax black, cinereous; proboscis, legs and abdomen yellow. Eyes contiguous for a considerable distance on the front, ocellar tubercle prominent, with a few small brown hairs; face black, cinereous, concave and receding below; antennae yellow, short, the third joint, except its base, infuscated, the three joints of successively increasing length; arista apical bare, slender; proboscis retracted, short, yellow, palpi very small, yellow; occiput black, rather flat, almost bare. Thorax black, cinereous, especially on the sides; four faint brown lines on the dorsum, the two inner ones close together, abbreviated behind, the two outer ones abbreviated in front; on the side of the dorsum, before the transverse suture, are three small bristles; before the scutellum, at each side, are three or four very small ones; on the margin of the scutellum are five pairs of larger ones, with a considerable median interval; the scutellum yellowish, except on the disk; humeri a little yellowish; halteres yellow, the large, crumpled knob a little infuscated; squamae yellow, with delicate yellow cilia; metanotum black. Abdomen yellow, all the incisures, except the first, narrowly blackish (the first slightly blackish at the sides); hypopygium exserted, rounded, rolled up under the fifth segment; on the hypopygium and along the sides of the abdomen are fine, erect hairs, longer, more bushy, and yellow anteriorly; behind they are brown. Fore and middle legs, including coxae and tarsi yellow, the femora moderately infuscated above, and with a stripe of black hairs on the front; the tibiae gradually and moderately infuscated from near the base; hind tarsi as figured and above described. Wings subhyaline, slightly infuscated toward the apex; the space between auxiliary and first longitudinal cells yellow; third vein ending exactly in the apex; fourth vein forked, the posterior branch ending half way between point of furcation and the margin; hind cross-vein hardly more than half its length from the margin.

Female.—Length, 4.8 mm. Front rather wide, narrowing slightly below, opaque dark brown in color, near the antennae cinereous, with a median depression; proboscis and palpi larger, antennae smaller than the male. The brown lines of the thorax are more distinct. The pos-

terior part of the thorax, with only two bristles on each side; scutellum with three pairs of bristles. Abdomen yellow, scarcely infuscated at all. Legs wholly yellow, except the tarsi, which are somewhat infuscated toward the end; they are compressed and enlarged as shown in figure. Venation as figured; the posterior branch of the fourth vein comes nearer the margin than in the male, but does not reach it.

Material examined: The type is a male, captured October 21, 1905, in the foothills about six miles west of Stanford University. There is another male (cotype) in the collection of the entomological department of Stanford University, collected in the vicinity October 7, 1900. Nine females, all collected by myself in the same vicinity as the first-mentioned male, on October 21 and 28, 1905. Two of these cotype females will be deposited in the collection of the entomological department of Stanford University. The type and the other females will remain for the present in my own collection.

EXPLANATION OF PLATE IV.

1. Hind tarsus of *Calotarsa calceata*, male, enlarged (after Snow).
2. Hind tarsus of *C. ornatipes*, male, enlarged (after Snow).
3. Hind tarsus of *C. insignis* n. sp., male, outer side x 20.
4. Head of *C. insignis*, male, front view, x 20.
5. Hind tarsus of *C. insignis*, female, outer side, x 25.
6. Antenna of *C. insignis*, male, inner side, x 40.
7. Wing of *C. insignis*, female, x 15.

Some new or little known Aleyrodidae from Connecticut.—II.*

By W. E. Britton.

Aleyrodes forbesii Ashmead.

(*aceris* Forbes. Name preoccupied).

A. aceris Forbes. 14th Report Insects of Illinois, p. 110, 1884.

A. aceris Forbes. Packard, 5th Report, U. S. Entomological Commission, p. 422, 1890.

A. forbesii Ashmead, Bull. 45, U. S. National Museum, p. 274, 1893.

A. forbesii Ashm. Quaintance, Technical Bull. 8, Bureau of Entomology, p. 27, 1900.

A. forbesii Ashm. Morrill, Psyche, Vol. X, p. 82, 1903.

A. forbesii Ashm. Bemis, Proc. U. S. National Museum, Vol. XXVII, p. 503, 1904.

* For the first paper on this subject, see Ent. News, Vol. XVI, p. 65, March, 1905.

This is a large species, the pupa measuring about 1.5 x 1 mm., and from oval to oblong in shape. It is considerably raised above the surface of the leaf, and the pupa case soon falls away, leaving only a portion of the marginal rim of wax. Varying from light yellowish green with purplish markings, to purple or chocolate with green or whitish spots or blotches near the margin. Dorsum flat, without spines or wax rods. I have never seen the adult of this species, but it is described as white or yellowish, with immaculate wings. Larvae and pupae are not abundant, and usually one or two are found upon a leaf.

Collected by the writer September 20, 1904, September 8, 1905, at Westville, Ct.; September 15, 1905, New Canaan, Ct.; on red and silver maple. At New Canaan it seemed to be most abundant on a cut-leaved variety of the silver maple.

Aleyrodes packardi Morrill.

A. packardi Morrill, Canadian Entomologist, Vol. XXXV, p. 25, 1903; Psyche, Vol. X, p. 83, 1903; Technical Bull., No. 1, Mass. Agr. Expt. Station, August, 1903.

For several years this species has been confused with *A. vaporariorum* Westwood, and in literature, many references to the latter doubtless refer to *A. packardi*. For a more complete bibliography the reader is referred to Canadian Entomologist, Vol. XXXV, p. 35, and Technical Bull. No. 1, Mass. Agr. Expt. Station, p. 61.

Pupa about .80 x .48 mm., broadly oval. Dorsal surface nearly flat. Two series of marginal wax rods; the outer radiating, somewhat curved, the length about equal to one-half the breadth of the pupa; the inner series are nearly twice as long, and are curved upward and inward over the body.

Rather abundant on the leaves of cultivated strawberries at West Hartford, June 30, 1905.

Aleyrodes mori Quaintance.

A. mori Quaintance, Canadian Entomologist, Vol. XXXI, p. 1.

A. mori Quaintance, Technical Bull. 8, Division of Entomology, p. 29, 1900.

A. mori Quaintance, Bemis, Proc. U. S. National Museum, Vol. XXVII, p. 507, 1904.

Pupa about .70 x .55 mm., elliptical, body black with broad marginal fringe of white wax. A striking species. Adult with clouded wings.

On leaves of box elder, New Haven, July 22; *Fraxinus americana*, *Carpinus caroliniana* and *Celtis occidentalis*, New Haven, September 20, 1904; *Celtis occidentalis* and catalpa, New Haven, September 8, 1905.

I have never seen this as abundant as figured by Quaintance (Can. Ent. Vol. XXXI, pl. 1), but usually not more than three or four specimens occur on a leaf.

Morrill described a subspecies *maculata* Psyche Vol. X, p. 81, 1903), which differed from *mori* in the adult stage by having a bright yellow body. I have not reared or obtained adults, but Professor Quaintance has examined some of the pupa cases, and pronounces the species *mori*.

Aleyrodes fernaldi Morrill.

A. fernaldi Morrill. Psyche, Vol. X, p. 83, 1903.

A medium-sized oval species, pupa case about .78 x .50 mm., with no wax rods. Dorsal surface flat, color pale greenish white. Adult, body pale yellow, wings immaculate.

Occurring on the under surface of leaves of spiraeas Van Houtei and Anthony Waterer in a nursery near New Haven, September 8, 1905.

Aleyrodes vaporariorum Westwood.

A. vaporariorum Westwood, Gardeners' Chronicle, p. 852, 1856.

A. vaporariorum Westw. Signoret, Ann. de le Soc. Ent. de France, p. 387, 1867.

A. vaporariorum Westw. Britton, Bull. 140, Conn. Agr. Expt. Station, 1902. Report Conn. Agr. Expt. Station, p. 148, 1902.

A. vaporariorum Westw. Cary, Bull. 96, Maine Agr. Expt. Station, 1903.

A. vaporariorum Morrill, Technical Bull. No. 1, Mass. Agr. Expt. Station, 1903. Circular No. 57, Bureau of Entomology, U. S. Dept. Agr., 1905.

For more complete bibliography, see Report of Conn. Agr. Expt. Station, p. 159, 1902, and Technical Bull. No. 1, Mass. Agr. Expt. Station, p. 52, 1903.

This species is probably the most common of all described

aleyrodids occurrring in Connecticut. In greenhouses and dwellings it lives through the winter on various kinds of plants. Remedial measures are absolutely necessary to save the infested plants, and of these fumigation with hydrocyanic acid gas is perhaps the most successful. House plants can be dipped into a soap and water mixture (1 lb. to 8 gals.) with good results.

Larvae and pupae are oval, light green or yellow in color, and abound on the under sides of the leaves. Pupa about .70 x .50 mm., with submarginal row of wax rods. Six pairs of long curved wax rods are borne on the dorsum, which is somewhat convex.

Body of adult is yellow, wings white and immaculate.

A. vaporariorum has been collected and observed upon over sixty different food plants in Connecticut, but it is especially abundant on tomato, melon, cucumber, tobacco, *Ageratum*, *Lantana*, *Fuchsia* and heliotrope.

Formaldehyde as an Insecticide.

By M. V. Slingerland.

Cornell University recently purchased quite a large quantity of "Solidified Formaldehyde," subject to a written contract that "this material is guaranteed to kill bedbugs, moths and roaches, used with 4 ounces to 1,000 cubic feet and exposure to fumes of gas 8 hours, closed room." This was a good opportunity to test the insecticidal value of formaldehyde, and I made the following experiment:

Five live bedbugs were placed (one in each) in small pasteboard pill boxes, which were covered with one thickness of a muslin with meshes about one millimeter square. Ten live cockroaches were placed in each of three glass, pint, fruit-jars, covered with one thickness of a thin muslin with meshes nearly one-half millimeter square. These insects were placed in different parts of a room, some on the floor, others near the ceiling, and some about midway of the room, on top of some furniture. The room contained 1,760 cubic feet, but was

nearly one-third full of furniture, so that there was not over 1,600 cubic feet of air-space to be fumigated. The room was made as tight as practicable and eight ounces of the Solidified Formaldehyde were used, strictly according to directions, in a generator specially designed for using it. The fumigation was begun at nine o'clock A. M., January 30th, 1906, and the room was not opened until the next morning, thus continuing the fumigation for twenty-four hours. As the formaldehyde costs about 35 cents an ounce, it was an expensive operation for a single, medium-sized room.

Upon opening the room, the formaldehyde fumes were sufficiently strong to make one's eyes and nostrils smart, and it was several minutes before I could go into the room comfortably to get the insects.

Although more than the designated amount of Solidified Formaldehyde was used and the fumigation was continued longer than specified, yet it resulted in not killing a single bedbug or cockroach.

Dr. L. O. Howard writes me that "The Public Health and Marine-Hospital Service report formaldehyde as not possessing insecticidal properties against mosquitoes." Also, that Mr. Titus, one of his assistants, knows of an instance where a large number of Lepidopterous pupae in soil were in a small room where formaldehyde gas was generated (strength of the gas unknown), and from none of these pupae were adults afterwards bred, while from other pupae from the same material, not in this room, the moths came out in usual numbers. The inference is reasonably plain that the gas killed the pupae, but the evidence is not conclusive, as it was not an experiment but simply an accident.

In 1901, C. L. Marlatt, of the Bureau of Entomology, reported (Bull. 30, New Series, p. 39) some experiments to test the insecticidal value of formaldehyde gas. Some earlier trials had resulted in indicating little value in the gas for killing insects. Then a test was made against the Angoumois grain moth and the bean weevil in stored seeds. The gas was generated to 3 or 4 times the amount necessary for germicide purposes. Only a few of the moths (some that were flying

about) were killed, but the weevils were not injured in the least.

In 1897 (Rept. Ottawa Expt. Farms for 1897, p. 106). Duchess apple trees were sprayed in Canada with formalin at the strengths of 1, 2, and 4 ounces to 5 gallons water. No injury or benefit resulted to the foliage or fruit, except a slight indication of some deterrent influence against the codling-moth; plant-lice were not killed.

In 1900, C. P. Lounsbury, Government Entomologist of Cape of Good Hope, South Africa, reported (his Report for 1899, p. 17) the following important experiment in fumigating railway carriages for bedbugs. The experiment was made under supervision of a professional chemist. "The bedbugs were not destroyed even when left exposed for two full days in a carriage, treated with all the gas contained in 800 c.c. (about 12 ounces of formaldehyde, or not quite as strong as I used it) of the water solution of formalin. The gas was forced into the carriage under heavy pressure, and the bedbugs were enclosed in a piece of mosquito netting suspended near the middle of the space. The carriage was of about 2,500 cubic feet capacity, and all its cracks, crevices and air-holes were tightly stopped with cotton wool. House-flies and aphids shut in the carriage were found dead, but larvae and adult scale insects of several species, and plant-bugs of three species were found to have survived. Formaldehyde gas of far greater but indefinite strength, generated from formalin tablets, was also inefficacious in destroying imprisoned bedbugs."

Finally, there has just come to hand the report of another experiment by Prof. Dr. K. Lampert with formaldehyde against insects in Germany (Zeitschrift für Wissenschaftliche Insektenbiologie, Vol. XI, January 31, 1906, p. 12). In a room containing about 70 cubic meters (2,400 cu. ft.) 1,100 c.c. of 40 per cent. formalin (= about 17 ounces of formaldehyde, or stronger than I used it in my experiment) was generated for 4 hours. A number of cockroaches (*B. orientalis* and *germanica*), 2 spiders, several larvae of the larder beetle (*D. lardarius*), some sow-bugs, 3 larvae of saw-flies, meal-

worms, and earthworms were placed in the room in glasses covered with open netting; one earthworm was buried in soil. All of the Arthropods survived without any injury the effects of the fumes in which a man would probably die in a short time, and in which dogs and birds perish. Two earthworms exposed to the fumes without soil had dried out and were dead, while the one in the soil remained fresh and lively. "This astonishing resistance to the fumes," says Lampert, "could possibly be explained by the tracheal respiration as the animals close the breathing-holes and the air collected in the tracheæ would be sufficient for the little breathing necessary. That the chitinous armor is of little importance in resisting the fumes, is proven by the ability to resist of the thin-skinned saw-fly larvae."

I have found in a hasty review of the literature no other records of experiments with formaldehyde as an insecticide. The evidence submitted seems to be overwhelming that formaldehyde has little or no insecticidal qualities, when used in practicable quantities, and especially against household insects.

Dragonflies (Odonata) Collected by Dr. D. A. Atkinson in Newfoundland, with Notes on some Species of Somatochlora.

By E. B. Williamson.

(Plates V and VI.)

The only list of Newfoundland dragonflies known to me is the paper in Ent. Month. Mag. XI, pp. 241-243, April, 1875, by De Selys, based on collections made by John Milne. De Selys records the following species: *Leucorhinia hudsonica*, Selys 1 ♂, *Cordulia shurtleffi* Scudder, 1 ♀, *Epitheca cingulata* Selys, 2 ♂ and 3 ♀, *Epitheca forcipata* Scudder, 1 ♀, *Aeschna hudsonica* n. sp. 1 ♂ and 4 ♀ (also from Canada), *Aeschna clepsydra* Say (?) 2 ♀, *Gomphus* (?) *sp.* 1 ♂, and *Aenallagma boreale* n. sp. 1 ♂ and 1 ♀.

In Ent. News, May, 1902, pp. 144-146, I recorded the species taken by Dr. Atkinson at the Magdalen Islands. This list was remarkable for its cosmopolitan character. Only 6 species

were taken in the almost barren Magdalens, and 3 of these are not represented in the Newfoundland collection: *Agrion resolutum*, *Enallagma hageni* and *Aeshna juncea*, all widely distributed species which more extensive collecting would probably show as belonging to the Newfoundland fauna. In fact, *Aeshna hudsonica* Selys mentioned above is probably only a variety at the most, of *juncea*. Dr. Atkinson collected in Newfoundland only two days, July 7 and July 21, 1901, and at two localities, Bay of Islands, and Grand Lake, yet his collection contains 14 or possibly 15 species, and, in its richness of Aeshnas and Somatochloras, it is, for its size, the most interesting I have ever studied. The study of these Somatochloras from time to time has delayed the recording of Dr. Atkinson's captures till this late date.

Enallagma ebrium. Hagen. Eight males from Grand Lake, July 21, 1901.

Enallagma calverti, Morse. Five males from Bay of Islands, July 7, 1901. No Enallagmas in the collection agree with the color pattern of *Enallagma boreale* Selys, based on a single specimen of each sex taken in Newfoundland. But the description of the abdominal appendages of the male of *boreale* applies almost certainly to the species later described by Morse as *calverti*. In so far as it will probably be possible for some of our European friends to determine this matter certainly by a study of the type of *boreale*, I have here recorded the species, in conformity with recent usage, as *calverti*.

Enallagma cyathigerum, Charp. Six males from Bay of Islands, July 7, 1901. Four female Enallagmas in the collection I have not attempted to determine specifically.

Aeshna clepsydra Say. Bay of Islands, July 7, 1901. 3 ♂ and 1 ♀; Grand Lake, July 21, 1901, 1 ♂ and 2 ♀. To this species for the present are also referred 1 ♂, Grand Lake, July 21, 1901, and 1 ♀, Bay of Islands, July 7, 1901. These two specimens were referred to Dr. Calvert, who wrote, under date of January 27, 1904, "The ♂ *Aeshna* from Grand Lake, Newfoundland, is like a ♂ from Chicoutimi, Quebec, in the broken stripes on sides of thorax,* in denticulated carina of

*'Two other ♂♂ from Chicoutimi have the stripes of thorax apparently not broken.'

superior appendages, and in size and color of pterostigma, but differs in shape of tip of superior appendages, viewed from above, the Chicoutimi ♂ having the tip shaped like fig. 7, Ent. News, 1894, p. 11. The original (from Lake St. Regis, N. Y.), of my fig. 5 (l. c.), also has the broken stripes on the sides of the thorax, but has the pterostigma of front wing measuring only 3 mm. on its costal edge; length of front wing, 45 mm. A female from Lake St. Regis has stripes on sides of thorax very nearly identical with those of this ♀ from Bay of Islands, Newfoundland. It is rather small—abdomen (exclusive of appendages) 45 mm., hind wing, 43 mm.; pterostigma smaller, the costal edge of pterostigma of front wing, 3.75 mm. You will see, therefore, that your Grand Lake ♂ is very nearly identical with the Lake St. Regis ♂, which, in 1893, I called *clepsydra*. Whether the breaking up of the stripes on sides of thorax entitles the holder to a distinct specific or varietal name I will not now decide."

The appendages of this Newfoundland ♂ are in bad condition. The color pattern of thorax of both ♂ and ♀ are very different from any other specimens of the large series of *clepsydra* I have seen from Newfoundland, Ohio, Michigan and Indiana. In these two the thoracic pattern is more suggestive of *juncea* though, of course, the lateral stripes are not broken in *juncea*. *Aeshna hudsonica*, as Dr. Calvert writes me, seems to be hardly distinct from *juncea*, even as a variety.

Aeshna sitchensis Hagen. Bay of Islands, July 7, 1901, 1 ♂ and 1 ♀. Determination confirmed by Dr. Calvert.

Aeshna septentrionalis Burm. Grand Lake, July 21, 1901, 1 ♀. Determination confirmed by Dr. Calvert.

Cordulia shurtleffi Scudder. Bay of Islands, July 7, 1901, 2 ♂ and 1 ♀.

Somatochlora cingulata Selys. Bay of Islands, July 7, 1901, 1 ♂; Grand Lake, July 21, 1901, 1 ♀.

Somatochlora albicincta Burm. Bay of Islands, July 7, 1901, ♂ 1 and 1 ♀.

Somatochlora hudsonica Selys. Grand Lake, July 21, 1901, 1 ♂; Bay of Islands, July 7, 1901, 2 ♀.

Somatochlora forcipata Scudder. Grand Lake, July 21, 1901, 1 ♂.

Leucorhinia hudsonica Selys. Bay of Islands, July 7, 1901, 4 ♂ and 4 ♀.

Sympetrum costiferum Hagen. A single ♀, badly damaged, from Bay of Islands, July 7, 1901, apparently belongs to this species.

Libellula quadrimaculata L. Bay of Islands, July 7, 1901, 1 ♀.

Notes on some species of Somatochlora. *Somatochlora semicircularis*, *septentrionalis*, *artica* and *forcipata* are a group of closely related species with long slender abdomens and relatively short wings. The difficulty in determining Dr. Atkinson's single ♂ of this group led to a study of these four species. Of *forcipata* I have seen but two specimens, the headless specimen, collected by Dr. Atkinson, and a male in the Harvey collection, S. Lagrange, June 28, 1898, F. L. Harvey, collector. The abdominal appendages of the Maine specimen seen in profile, are much more strongly arched than in the Newfoundland specimen. I have obtained from Mr. R. C. Osburn the specimen mentioned by him as *forcipata*, in ENT. NEWS, June, 1905, p. 191,* from Port Renfew, British Columbia. I refer this specimen to *semicircularis*. I am able to separate *semicircularis* and *forcipata* only by the abdominal appendages of the male. The Newfoundland *forcipata* is more slender than the Maine *semicircularis* (a difference pointed out by De Selys for the two species), but the Maine *forcipata* is about as robust as the two specimens of *semicircularis* which I have seen from that State —the one figured and a second from Orono, Maine, July 16, 1891, F. L. Harvey, collector, referred to in ENT. NEWS, May, 1892, p. 116, as *forcipata*. On the basis of this Orono specimen, *semicircularis* can be added to the New England fauna. Scudder's description of *forcipata* fits the two specimens which I have referred to this species in the form of the appendages and in the presence on abdominal segment 5 and the two or three following segments of a distinct basal, lateral small yellow spot. These spots are wanting in the single male of *septentrionalis* I have seen and in *semicircularis* from Maine

* In the same paper by Mr. Osburn, p. 192, he identifies two imperfect ♀ of *Sympetrum* as *obtrusum*. After a study of both specimens I believe they belong rather to *pallipes*.

and Colorado. But *semicircularis* from British Columbia have the abdomen either uniformly colored or spotted. Of *semicircularis* I have studied: Maine, 2 ♂; mountains of Southwestern Colorado, 11 ♂ and 4 ♀ loaned me by Dr. Calvert; Langford Lake, British Columbia, 2 ♂, R. C. Osburn, collector; Glacier, British Columbia, 4 ♂, R. C. Osburn, collector; Port Renfrew, British Columbia, 1 ♂, R. C. Osburn, collector. Characters of 13 males of this material were tabulated. The abdomen varies from 34-39 mm. in length, averaging between 38 and 39 for all the material excepting the Colorado specimens, which are 34. *Forcipata* measures 37 and 38. In length of hind wing all specimens of *semicircularis* are very uniform, varying from 29-32, the majority being 31, which is the exact measurement for this part in both *forcipata*. The color of the costa will not separate the two species. Postcubitals in the front wings vary from 5 (in a single wing) to 8 (in 2 wings). The usual number is 6 or 7 in both species. The yellow spots on frons in front are variable in size, regardless of locality. The lateral thoracic stripes are variable in extent (at least in dried material), and will not serve to separate species or localities. *Forcipata* (both specimens) and *semicircularis* from Maine have the anterior femora brown beneath; all the other specimens of *semicircularis*, so far as I could determine, have the anterior femora black beneath. One *semicircularis* from Maine has the upper lip with two clear brown spots. All other specimens of both species have this lip black. Nasus in *forcipata* (one specimen) and *semicircularis* from Maine is dull brown; in all western specimens of *semicircularis* and in *septentrionalis*, the nasus is metallic, like the frons, and the *semicircularis* from Colorado have the labrum almost or quite metallic. So, as stated, I can find no characters other than those of the appendages for separating *forcipata* and *semicircularis*. These characters, both of superior and inferior appendages, seem good so far as specimens before me go, but it is possible that more extensive material might render these inadequate for the separation of the two species as at present understood.

Septentrionalis, apart from its basal wing markings, is sepa-

rated from the others by its appendages and the relatively short hind wings (abdomen 36 mm.; h. w. 26 mm.).

Somatochlora hudsonica, *alpestris*, *albicincta* and probably *cingulata** form a group of closely related species with relatively robust abdomens and long wings. *Hudsonica* finds its closest ally in the European *alpestris* from which it is separated, among other characters, by the great development of the basal spine of the superior appendages. In *alpestris* the basal spine and the spine following it are about equal in size, and the profile view gives an accurate idea of the full size of these spines. In its wing markings *hudsonica* is like *septentrionalis*.

Albicincta is very distinct from the two preceding species; and *cingulata* is at once distinguished from them all by its larger size and the broadly forked inferior appendages. The ♀ of *hudsonica* from which the figure of the vulvar lamina was drawn has the abdomen very flattened and the vulvar lamina much pinched together, so the figure is probably somewhat deceptive. The second ♀ collected by Dr. Atkinson has the last abdominal segments wanting. The vulvar laminae represented in figs. 20 and 21 are normal in shape, the abdomens not being distorted.

EXPLANATION OF PLATES V AND VI.

All specimens figured are in collection of E. B. Williamson.

Fig. 1. Appendages in profile of *Somatochlora septentrionalis* ♂, Orono, Maine, June 18, 1898, Bartle Harvey, collector. This specimen has the left superior appendage wanting and the wings are in bad condition.

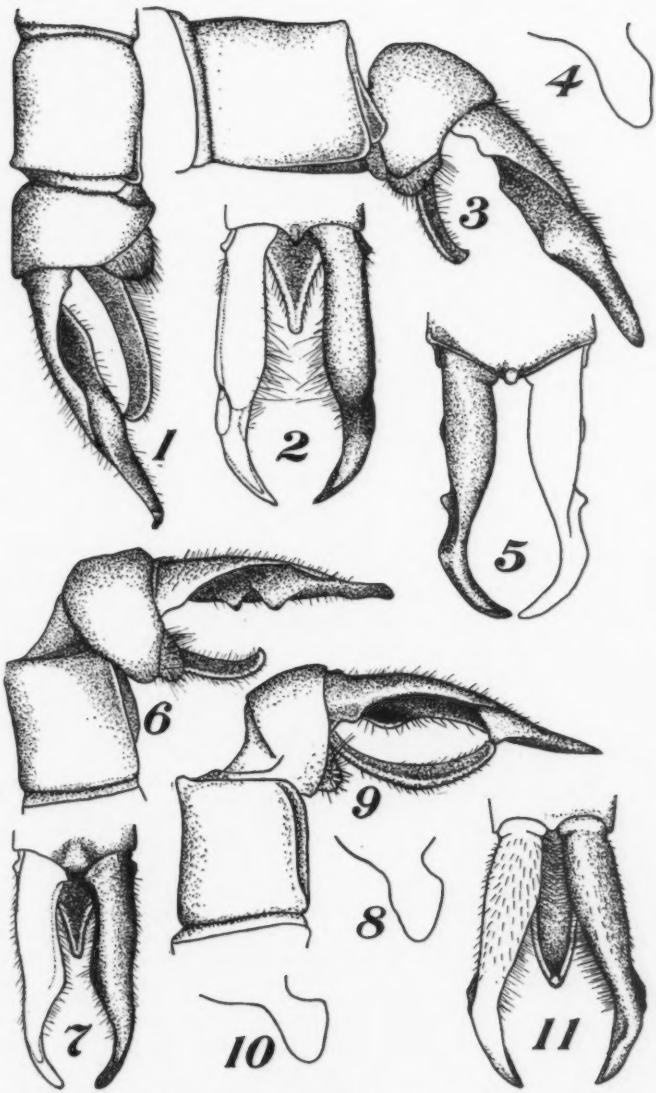
Figs. 2, 3, 4, and 5; *Somatochlora semicircularis*. Figs. 2, 3, abdominal appendages and 4, genital lobe of ♂, Manchester, Maine, July 7, 1898, Miss M. Wadsworth, coll. Fig. 5, superior appendages of ♂, Langford Lake, British Columbia, July 20, 1902, R. C. Osburn, coll.

Figs. 6, 7, and 8. *Somatochlora arctica*. Figs. 6 and 7 abdominal appendages and fig. 8, genital lobe of ♂, Leuzerheide, July, 1904, K. J. Morton, collector.

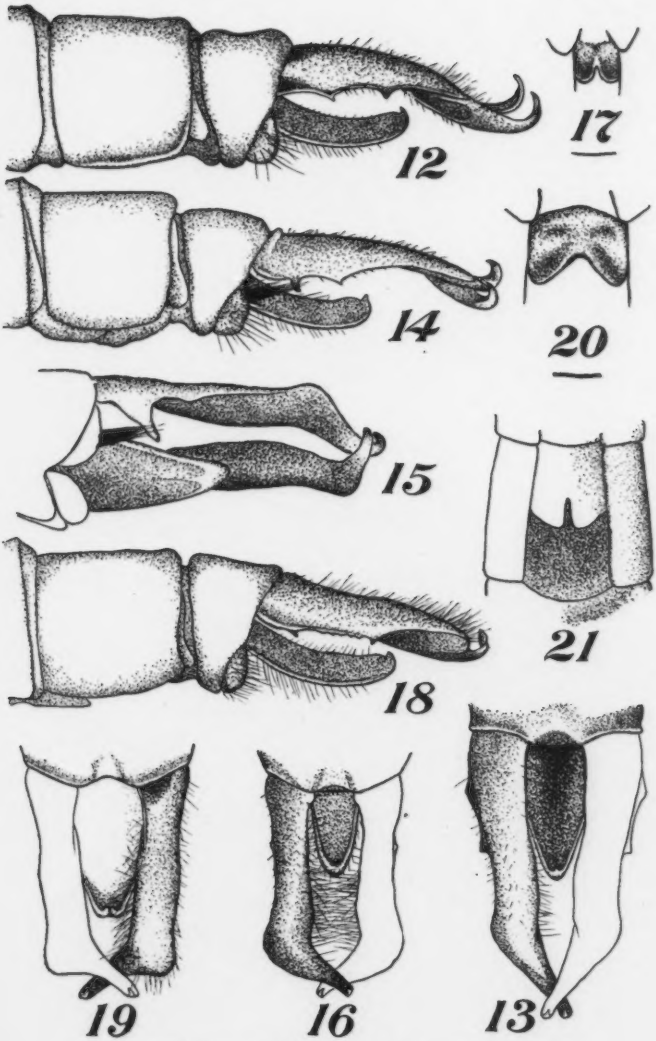
Figs. 9, 10, and 11. *Somatochlora forcipata*. Figs. 9 and 11, abdominal appendages, and fig. 10, genital lobe of ♂, Grand Lake, Newfoundland, July 21, 1901, D. A. Atkinson, collector.

Figs. 12 and 13, *Somatochlora alpestris* abdominal appendages of ♂, Leuzerheide, July, 1904. K. J. Morton, collector.

* *Franklini* is known to me only from the description of the ♀.



NEWFOUNDLAND ODONATA, WILLIAMSON.



NEWFOUNDLAND ODONATA, WILLIAMSON.

Figs. 14, 15, 16, and 17. *Somatochlora hudsonica*. Figs. 14, 15 and 16, abdominal appendages of ♂, Grand Lake, Newfoundland, July 21, 1901, D. A. Atkinson, collector. Fig. 17, vulvar lamina of ♀, Bay of Islands, Newfoundland, July 7, 1901, D. A. Atkinson, collector. This female has the abdomen laterally crushed.

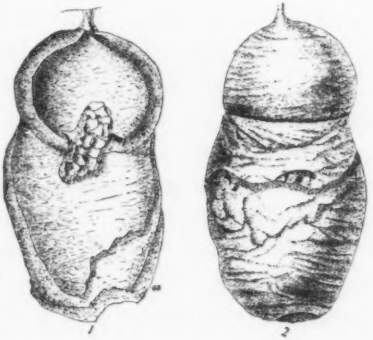
Figs. 18, 19, and 20 *Somatochlora albicincta*. Figs. 18 and 19, abdominal appendages of ♂, Kukak Bay, Alaska, June, 1899. T. Kincaid, collector. Fig. 20, vulvar lamina of ♀, Kadiak, Alaska, July 4, 1899, M. Cole, collector.

Fig. 21. Vulvar lamina of *Somatochlora semicircularis* ♀, mountains of Southwestern Colorado, 11,000-12,000 feet.

An Emergency Case in Insect Architecture.

By S. Arthur Johnson.

Last fall I discovered a *Vespa* nest attached to the north end of the entomology building. Attracted by its curious form, I secured it and was surprised to find that it represented an insect tragedy. From the location of the nest and its form, it is evidently one made by *Vespa diabolica*, though no insects were found in it to confirm this statement.



The nest had been begun in the usual way and reached the stage where two layers of paper formed a sphere about a comb containing a number of cells. At this time, the cord of suspension gave way, dropping the comb to the bottom of the nest, where, being unable to pass through the aperture on account of its size, it hung suspended in an inclined position. The wasp then built on the lower half of the original sphere, a very much elongated structure, composed of about three very irregular layers. The exterior was unusually rough, and so insecurely attached that it broke away with very little handling of the nest.

Apparently this attempt to repair damages was not successful, for the work never advanced beyond this crude stage. One of the larvae, at least, reached the pupa stage, for its cocoon was found in the comb.

The incident is interesting as illustrating what an insect will do when brought face to face with a new condition.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., APRIL, 1906.

The recognition of the value of economic Entomology among the people is shown by the fact that two important bills for the suppression of insects are not unlikely to become laws. One is a bill to appropriate seventy thousand dollars a year for five years to suppress mosquitoes in New Jersey*, and the other is a bill presented in the National House of Representatives to appropriate two hundred and fifty thousand dollars to check the ravages of the Gypsy Moth. There can be no question of the value of properly directed scientific work against these pests, and we believe a large return could be had from the expenditure of the money, providing no human parasites work their way in. The very moment money enters into scientific work there will be some one with an eye on the main chance. Entomologists should religiously frown down all such attempts and endeavor to put the study on the highest plane and thus demonstrate its value to all.

A CORRECTION.—The larval stages described by Mr. J. G. Grundel in March, '05 NEWS as *Lemonias vigulti* are those of *L. mormo*, a closely allied species. Probably the preparatory stages of *vigulti* are similar, and what will apply to one will apply superficially to the other.—C. R. COOLIDGE, Palo Alto, Cal.

* This bill has become a law.

Doings of Societies.

Minutes of meetings of Brooklyn Entomological Society, held at the residence of Mr. George Franck, 1040 DeKalb Avenue, Brooklyn, N. Y.

November 5, 1905.—Thirteen persons present, the President in the chair.

Mr. George P. Engelhardt was elected librarian, *vice* Mr. Ernest Shoemaker resigned.

Mr. Franck exhibited a specimen of *Argynnis idalia*, from Newark, N. J., showing an extreme case of suffusion. The upper side of the primaries was heavily clouded, while that of the secondaries was almost entirely wanting in maculation. The under side of the wings was similarly affected, the secondaries having only a single row of silver near the inner margin and a few near the base. Mr. Franck also exhibited a ♂ *Hyperchiria io*, the wings of which largely partook of the coloration of those of the ♀.

Mr. Schaeffer presented a number of specimens of coleoptera comprising species not only new to our fauna but to science, which he had taken during the recent summer in the Huachuca Mountains, Arizona. Among those shown were *Amblychila baroni*, *Cicindela obsoleta var. santaclarae*, *Pasimachus viridans*, *Clerus*, *n. sp.*, *Romaleum*, *n. sp.*, *Oncideres*, *n. sp.*, *Cassida mexicana*, *Estola*, *n. sp.*, *Agrilus*, *n. sp.*, and a number of species of *Scarabæidae*. *C. santaclarae* occurred in company with swarms of grasshoppers, which, being similar in color (green), rendered distinction difficult.

Mr. Schaeffer gave some further details relative to his method of preservation of specimens and mode of living. A tent was made for shelter which at times barely sufficed to protect the collections and apparatus from rain.

December 7, 1905.—Seventeen persons present, the President in the chair.

Mr. Franck announced that a sufficient number of subscriptions had been obtained to ensure the publication of the Glossary of Entomological Terms prepared by Prof. John B. Smith.

Mr. George P. Engelhardt gave a description of his manipu-

lation of and experiences with a hive of bees located in the Children's Museum of the Brooklyn Institute of Arts and Sciences. The hive was placed at a window facing east and connected with the outer air by a covered passage and was specially constructed for observation, having inner sides of glass through which the operations of the inmates were visible. Exterior doors of wood screened the interior glass sides from light when not subject to inspection. Although in the midst of a city the bees had no difficulty in collecting materials for honey, comb, etc., apparently obtaining sufficient for their purposes from the vegetation in streets and yards and the nearby park. ARCHIBALD C. WEEKS, *Secretary*.

DR. DYAR'S Editorial in the March, 1906, Jour. N. Y. Ent. Soc. is a work of art. He says I attempt a misrepresentation of his Review of the Hesperidæ. I did nothing of the kind; I only stated facts which any entomologist can verify from the literature. Dr. Dyar says "We *presume* he is right in both cases." Why does he say "presume" and then proceed to *try* and correct his errors? He does not come out and say his genus *Anatrytone* is a synonym, but says *Atrytone* may be given another name. I quote again, "the mistakes can be easily corrected by transferring *manataaqua* to *Thymelicus* and proposing a new name for *Atrytone*." Had Dr. Dyar really known anything about the genera he would never have suggested anything of the kind, as *manataaqua* is the type of Scudder's genus *Limochroes*. Dr. Dyar uses this genus and places nine species under it, including the type *manataaqua*. Aègrescit medendo.—HENRY SKINNER.

Lady Bug gave a party,
It was a grand affair;
The finest Beetle dandies
And the nattiest Gnats were there.

The Glow Worm glowed his brightest
And the Hornet played his horn,
The Butterfly brought butter
And the Miller Moth brought corn.

The Caterpillar sat and purred,
The Horsefly galloped high,
The Ants came with their uncles
And the Spiders came with pie.

The June Bug in his buggy came,
Dragged by the Dragon Fly,
The Centipede gave his last cent
To see the pair go by.

It was a splendid party,
But when the last was done,
The Hop-toad sat outside the door
And swallowed every one.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

I have for exchange perfect examples of *Baileya ophthalmica*, *Scopelsoma devia*, *tristigmata*, *Xylina grotei*, and many other local species of Lepidoptera for exchange--Fred. Marloff, Oak Station P. O., Allegheny Co., Pa.

Specimens of the genus *Necrophorus* from all parts of the United States; will give good exchanges in other Coleoptera—J. O. Martin, Wilbraham, Mass.

For Exchange.—Pupae of *Smerinthus geminatus*, *Dolba hylaeus*, *Papilio ajax*, *Eacles imperialis* and cocoons of *Telea polyphemus*.—R. R. Rowley, Louisiana, Mo.

Wanted.—Records of Ontario insects, for compilation of list. Please give authentic data and indicate source of identifications. Lists of smaller orders and Neuropteroids wanted at once.—Franklin Sherman, Jr., Dept. Ent. Ont. Agr. Col., Guelph, Canada.

Lepidoptera: Exchange for specimens new to my collection. Exotics also accepted.—A. Troschel, 853 Irving Park Boulevard, Chicago, Illinois.

Lepidoptera.—Liberal exchange given for desirable North American Heterocera.—Henry Engel, Box 35 Oak Station P. O., Allegheny Co., Pa.

European Lepidoptera in exchange for pupæ of native moths, especially *S. cynthia*.—Miss Kate W. Strong, Setauket, Long Island, N.Y.

Wanted.—*Lycænas*, *Theclas*, *Chionobas* and *Anthocharis*, either for cash or exchange. Send list to H. H. Brehme, 44 Mercer street, Newark, N. J.

Papilios of the world desired. What do you wish in exchange?—C. F. Groth, 141 East 40th street, New York City.

Wanted, for cash or exchange, Bulletins U. S. Bureau of Entomology. Old series 1-5, 7-15, 18, 20, 21, 26, 27, 30, 33. New series 8, 39, Technical series, 1, 3, 5, 6, 7. Bib. Econ. Ent., parts 4, 5, 6.—Albert V. Taylor, Bedford, Ohio.

Wanted.—Bibionidæ of North America for which I will pay cash, also ENTOMOLOGICAL NEWS, Vol. XV, No. 9—W. A. Hooker, Bureau of Entomology, Washington, D. C.

Exchanges solicited from all sections of the country. Have hundreds of duplicates. Moths or butterflies. Send lists to Joseph H. Reading, 775 N. Rockwell St., Chicago, Ill.

Cicindelidae.—*C. celeripes* and other Nebraska and Iowa species to exchange for Cicindelidæ.—Frank H. Shoemaker, 2960 Dewey Ave., Omaha, Neb.

Wanted.—LeConte's "Revision of the Elateridæ:" also North American species of *Corymbites* and other Elateridæ and Buprestidæ.—C. O. Houghton, Del. Col. Agric. Expt. Sta., Newark, Delaware.

Wanted.—Vol. III, No. 1 "Papilio" and Vols. VIII and IX, Jour. N. Y. Ent. Soc., also Danaidæ of the world.—C. V. Blackburn, 101 Pine St., Woburn, Mass. (See Label adv.)

Tenodera sinensis.—Without doubt *Tenodera sinensis* is one of the most curious and interesting insects found in the United States of North America. I have egg masses of fertile eggs, as well as mounted specimens of the perfect insect to exchange. Regarding *Tenodera sinensis*, see ENT. NEWS, Vol. IX (1898) p. 144.—Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Pa.

Wanted.—North American Philanthidæ for study. Will determine fossorial Hymenoptera for the privilege of retaining desirable material.—J. C. Bridwell, Insectary M. A. C., Amherst, Mass.

Wanted.—Orchids plants or roots of them for cash or in exchange for brilliant exotic Lepidoptera, such as *Ornithoptera Urania cræsus, riphæus, morpho* and rare native species.—Chas. F. Timm, 170 Bleeker St., Brooklyn, N. Y.

Wanted.—Microlepidiptera, especially *Tineina* of North America. Will give named material in return; also Microlepidoptera and Coleoptera. Will buy desirable material.—Dr. W. G. Dietz, Hazleton, Pa.

Before the season opens, I wish to arrange with parties in the southern United States and Mexico for the collecting of Buprestidae and *Phanæus*. Good exchange given.—E. A. Klages, Crafton, Pa.

Coleoptera.—I wish to buy one or more original collectings of beetles from either North, South or Central America.—Fred. C. Bowditch, 164 Rawson Road, Brookline, Norfolk Co., Mass.

Wanted for Cash.—Transactions of the American Entomological Society, Vol. III (3). Will pay a fair price for a copy in good condition. W. C. Wood, 51 Fifth Avenue, New York.

Samia cynthia Cocoons to exchange for live pupæ and cocoons of *Hyperchiria io, Telea polyphemus, Triptogon modesta, Philimpelus achemon* or *P. pandorus*.—John H. Matthews, 3219 N. Thirteenth Street, Philadelphia, Pa.

Wanted eggs of *Anosia archippus*, living preferred, for the purpose of making photographs for J. W. Tutt's British Butterflies.—A. E. Tonge, Reigate, Surrey, England.

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